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# The balance of brains—corruption and migration

Corruption could be an important factor for emigration and immigration decisions by highly skilled professionals

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A highly skilled workforce is crucial for economic development and growth, especially in knowledge-based economies [1]. Consequently, workers with education, experience and knowledge have become an important resource in the twenty-first century, and governments have introduced policies to both improve education and skills training for native workforces and students, and attract skilled workers from abroad. Both strategies serve the increasing demand for skilled labour, but each has a different timescale. Investments in education have significant effects mainly in the long term, whereas 'importing' highly skilled migrants has more immediate results. Thus, many advanced nations—notably the USA, Germany, Switzerland, the UK, Canada and Australia—increasingly compete internationally to attract scientists, engineers and other highly educated professionals.

These foreign workers contribute to the economy of their host country at least as much as natives, according to some studies. Five of the eight scientists from the USA who received Nobel Prizes in 2009 were immigrants, and foreign-born researchers often outperform natives in terms of their contributions to science such as authoring influential papers, authoring patents and being involved in biotechnology companies [2]. At the same time, governments are also incentivizing highly educated citizens to remain in their home country [3]. This is not always an easy task. Highly skilled workers are mobile, flexible and more prone to emigrate, perhaps because the cost of migrating seems to be lower than for less skilled workers [4]. This notwithstanding, a high emigration rate is not a problem if it is countered by high immigration. In fact, what really matters is whether a country can achieve a positive 'balance of brains'—a higher inflow of skilled immigrants than the outflow of skilled emigrants. An article in the *Economist* highlighted the importance of this phenomenon for Italy. "What distinguishes Italy from its peers is not the absolute number of its exiled graduates [...], but that it has a net 'brain drain', something more typical of a developing economy. In other words, the number of educated Italians leaving the country exceeds the number of educated foreigners entering it" [5].

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What makes some countries more attractive than others to highly skilled workers? Things like the nature of the jobs available, wages, immigration policies, network effects, standard of life and living costs all matter. However, an issue that has not yet received much attention—but one that is probably important to highly skilled workers—is the prevalence of corruption within a given country. First, skilled natives will tend to leave corrupt countries and move to less corrupt ones where employment is meritocratic; second, foreign talents might not be attracted to a corrupt labour market, in which access to high-paying and prestigious jobs is determined by political affiliations or nepotism. As a consequence, corrupt countries might experience a prolonged loss in human capital, driven by an unfair labour market where string-pulling and connections matter more than skills and performance.

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To assess empirically the role of corruption in the migration choices of highly skilled workers, we studied net flows across 123 countries. By using migration data from Docquier *et al* [6] about workers aged 25 years and older with post-secondary education, we computed migration flows of foreign skilled workers between 1990 and 2000. We used the International Country Risk Guide corruption index as our measure of corruption (www.prsgroup.com/icrg.aspx). The index measures the extent to which "high government officials are likely to demand special payments" and "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licences, exchange controls, tax assessment, policy protection or loans" [7]. We rescaled the index to increase with corruption in absolute terms—each country received a score from zero to six, of which six means no corruption and zero represents the maximum level of corruption.

 


**Fig 1** | Corruption in 1990 and net migration flows.

Fig 1 illustrates how countries with low corruption levels, such as Germany and the UK, benefit from net inflows of high-skilled migrants, whereas highly corrupt countries, such as Italy or Mexico, experience a net outflow. To better study the phenomenon behind this descriptive evidence, we performed an additional econometric analysis. We regressed the corruption index on the net flow of highly skilled migrants weighted by population and found a negative correlation (significant at the 1% level in a two-tailed *t*-test): highly corrupt countries experience a net loss of skilled workers (Table 1, column 1). The correlation remained significant even when we controlled for gross domestic product (GDP) per capita (Table 1, column 2). The result is therefore not determined by the fact that countries with relatively high GDP per capita tend to have lower corruption levels. Instead, for the same GDP per capita level, corrupt countries are more likely to experience net outflows of people.

Corruption might affect net migration through two channels: first, it might favour outflows by pushing highly skilled natives to migrate to other less corrupt countries; and second, it might hamper inflows by discouraging talented foreign workers from immigrating. To disentangle these two effects, we separately regressed our corruption variable on the inflows and outflows, weighted by the population (Table 1, column 3, column 5). As a robustness check, we controlled for GDP per capita (Table 1, column 4, column 6). The results show a negative and significant correlation—at the 1% significance level—between corruption and inflows, meaning that the higher the corruption of the country, the lower the immigration of foreign skilled workers. At the same time, there is a positive and significant correlation—at the 5% significance level, but only when controlling for GDP per capita—between corruption and outflow, indicating that skilled people are more likely to move abroad if their country of origin is highly corrupt.

Thus, the net loss of talented workers seems to be driven by both the lack of incoming and increased outgoing skilled workers. However, the first effect seems to be stronger in terms of the magnitude, statistical significance and explanatory power of the model. More specifically, whilst we observe a high, explained variance of the dependent variable ($R^2 = 0.27$ and $R^2 = 0.32$, respectively) in the inflow regressions (Table 1 column 3, column 4), the model has weak explanatory power for outflows (Table 1 column 5, column 6; $R^2 = 0.02$ and $R^2 = 0.07$, respectively). This might be due to other important factors—possible obstacles for highly skilled people to leave

**Table 1** | Corruption and net migration flows

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Dependent variable** | **Net** | **Net** | **Inflow** | **Inflow** | **Outflow** | **Outflow** |
| Corruption | −0.0028[a] (0.001) | −0.0032[a] (0.001) | −0.0020[a] (0.000) | −0.0015[a] (0.000) | 0.0009 (0.001) | 0.0018[b] (0.001) |
| GDP per capita | No | Yes | No | Yes | No | Yes |
| Constant | 0.0073[a] (0.002) | 0.0157[c] (0.009) | 0.0092[a] (0.001) | −0.0025 (0.004) | 0.0017 (0.002) | 0.0185[b] (0.008) |
| Observations | 123 | 115 | 123 | 115 | 123 | 115 |
| $R^2$ | 0.1522 | 0.1570 | 0.2691 | 0.3184 | 0.0194 | 0.0702 |

Robust standard errors in parentheses, [a]$p < 0.01$, [b]$p < 0.05$ and [c]$p < 0.1$.

the country, for example—and it suggests that corruption acts more as an obstacle for inflows than as an incentive for outflows.

In countries where corrupt people—through family ties, money or political affiliations—determine access to the job market, emigration of highly skilled labour is high and immigration of foreign talents is reduced, thus creating a net deficit. This effect could become increasingly problematic in the long run, as it could lead to a continuous deterioration of human capital. It might induce a vicious circle leading to a decrease in productivity levels and worsening economic conditions. Hence, fighting corruption is not only an important short- and medium-term policy concern, but has even more relevant implications in the long run, as it might have long-lasting effects on human capital and economic growth.

Another implication of our analysis is that investments in education in corrupt countries might be relatively futile—unless the corruption is simultaneously dealt with—and could actually benefit other countries when people emigrate to more attractive job markets. Thus, investments in education in a country riddled with corruption might fade away and become a positive externality for others. The flexibility and mobility of labour markets means that policies aiming to enhance the levels of education and skills for the native population are a necessary condition to build human capital, but are not sufficient alone. Government policy should also focus on fighting corruption in order to create a fair labour market that is capable of keeping native workers and attracting foreign talents.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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